CLAIMS

What is claimed is:

Sub Q1

1. A method for determining a set of weights for a set of arcs of a graph structure comprising the step of determining a genome representation for the weights such that the arcs of the graph structure that participate in a substructure of the graph structure are in a close proximity in the genome representation.

2. The method of claim 1, further comprising the step of evolving the weights using the genome representation.

3. The method of claim 1, wherein the step of determining a genome representation comprises the step of determining a matrix which indicates an optimal arrangement of the weights in the genome representation in response to the interconnections among a set of nodes and the arcs of the graph structure.

4. The method of claim 3, wherein the step of determining a matrix comprises the steps of:

determining a connection matrix which indicates interconnections among the nodes and the arcs;

determining a weight matrix which indicates an amount by which each element of the weight matrix is off a diagonal;

determining a product matrix of the connection matrix and the weight matrix.

5. The method of claim 4, wherein the step of determining a matrix further comprises the step of determining a score by summing a set of elements of the product matrix.

6. The method of claim 5, further comprising the step of minimizing the score by swapping one or more rows and columns of the matrix.

7. The method of claim 1, wherein the graph structure is a neural network.

8. A method for deriving a genome representation for a set of weights in a graph structure, comprising the steps of:

determining a substructure of the graph structure;

determining an arrangement in the genome representation such that the weights that participate in the substructure are in a close proximity in the genome representation.

9. The method of claim 8, wherein the step of determining an arrangement comprises the step of determining a matrix which indicates an optimal arrangement of the weights in the genome representation in response to the interconnections among a set of nodes and the arcs of the graph structure.

10. The method of claim 9, wherein the step of determining a matrix comprises the steps of:

determining a connection matrix which indicates interconnections among the nodes and the arcs;

determining a weight matrix which indicates an amount by which each element of the weight matrix is off a diagonal;

determining a product matrix of the connection matrix and the weight matrix.

11. The method of claim 10, wherein the step of determining a matrix further comprises the step of determining a score by summing a set of elements of the product matrix.

12. The method of claim 11, further comprising the step of minimizing score by swapping one or more rows and columns of the matrix.

13. The method of claim 8, wherein the graph structure is a neural network.